

CLAIMS

1. An optical disc having a digital information recording plane for recording or reproducing digital information thereon or therefrom, the optical disc comprising:

a visible information recording layer (207) that is formed on a reverse plane of a digital information recording plane, and can record visible information by a change in physical structure with irradiation of light from an optical pickup; and

a radius position information recording part (201) that is formed on a reverse plane of the digital information recording plane by dividing the optical disc into certain regions at a radius position, and records different radius position information on each divided certain region at the radius position with a reflectivity different from that of the visible information recording layer.

2. The optical disc according to claim 1, wherein the radius position information recording part (201) is a combination of stripe patterns each comprised of radial stripes arranged linearly in a radius direction for a certain rotation angle, each stripe pattern being at one site per one rotation of the optical disc.

3. An optical disc having an information recording plane for recording or reproducing information thereon or therefrom, the optical disc comprising:

a visible information recording layer (207) that is formed on a reverse plane of an information recording plane, and records visible information by a change in physical structure with irradiation of light from an optical pickup;

a radius position information recording part (201) that is formed on the reverse plane of the information recording plane by dividing the optical disc into certain regions at a radius position, and records different radius position information on each divided certain region with a reflectivity different from that of the visible information recording layer; and

a radius position information division region (801) that is provided between two pieces of radius position information adjacent to each other in a radius direction of the radius position information recording part to distinguish the radius position information on an inner peripheral side from the radius position information on an outer peripheral side.

4. The optical disc according to claim 1 or 3, further comprising a reflection layer that is provided under the visible information recording layer and has a reflectivity higher than that of the visible information recording layer, wherein a stripe pattern of the radius position information recording part is formed by a defect of the visible information recording layer.

5. The optical disc according to claim 1 or 3, further comprising a low reflection layer that is provided under the visible information recording layer and has a reflectivity lower than that of the visible information recording layer, wherein a stripe pattern of the radius position information recording region is formed by a defect of the visible information recording layer.

6. The optical disc according to claim 1 or 3, wherein a stripe pattern of the radius position information recording region is formed by a region having a high reflectivity and formed on the visible information recording layer.

7. The optical disc according to claim 1 or 3, wherein a stripe pattern of the radius position information recording region is formed by a region having a low reflectivity and formed on the visible information recording layer.

8. The optical disc according to claim 3, further comprising a reflection layer that is provided under the visible information recording layer and has a reflectivity higher than that of the visible information recording layer, wherein the radius position information division region is formed by a defect of the visible information recording layer.

9. The optical disc according to claim 3, further comprising a low reflection layer that is provided under the visible

information recording layer and has a reflectivity lower than that of the visible information recording layer, wherein the radius position information division region is formed by a defect of the visible information recording layer.

10. The optical disc according to claim 3, wherein the radius position information division region is formed by a region having a high reflectivity and formed on the visible information recording layer.

11. The optical disc according to claim 3, wherein the radius position information division region is formed by a region having a low reflectivity and formed on the visible information recording layer.

12. The optical disc according to claim 3, wherein the radius position information division region is formed by a region having no stripe pattern.

13. An optical disc as an information disc having an information layer for recording or reproducing information on or from an information track, the information disc comprising, on a reverse plane of the information plane thereof:

a visible information recording layer (207) that can record visible information by a change in physical structure with irradiation of light at a certain level or more; and

a radius position information recording part (201) that divides the information disc into certain ranges at a radius position, and previously records different radius position information on each divided certain range at the radius position having a reflectivity different from that of the visible information recording layer by means of a combination of radial stripe patterns each for a certain rotation angle,

the stripe patterns each comprising headers (901) having a fixed pattern of a fixed length and radius position information main bodies (902) having a fixed length, the radius position information main bodies being alternately and sequentially recorded a plurality of times in such a manner that the radius position information main body is interposed between the headers,

wherein the optical disc controls the radius position of the optical pickup to record visible information by reading the information of the radius position information recording region, and avoids erroneous detection upon occurrence of traverse between pieces of radius position information due to eccentricity, by adopting only radius position information of a radius position information main body interposed between pieces of information of effective headers as effective radius position information.

14. The optical disc according to claim 13, wherein the stripe patterns of the radius position information main bodies (902) are modulated so as not to correspond with information on the header (901) having a fixed pattern of a fixed length when the stripe patterns are connected to the front and rear portions of the header (901).

15. The optical disc according to claim 13, wherein the stripe patterns of the radius position information main bodies (902) are shorter in length than the headers (901) having a fixed pattern of a fixed length, and the headers are selected so that no stripe patterns of the radius position information main bodies correspond with information on the header having a fixed pattern of a fixed length when the stripe patterns of the radius position information main bodies are connected to the front and rear portions of the header.

16. An optical disc recording/reproducing device having a spindle motor (106) to which the optical disc according to claim 1 is set in such a manner that the visible information recording plane (202) faces an optical pickup (102) and writing visible information to the visible information recording layer (207) while moving the optical pickup in a radius direction, the optical disc recording/reproducing device comprising:

a radius position information detection section for reading the radius position information recording part (201) formed on the visible information recording plane of the optical disc by using the optical pickup so as to detect an existing position of the optical disc at the radius position; and

a visible information recording control section for reading out data of visible information to be written to the visible information recording layer (207) in accordance with the detected existing position, and controlling a power of laser beam applied from the optical pickup to the visible information recording layer so as to write visible information.

17. The optical disc recording/reproducing device according to claim 16, wherein the visible information recording control section is configured to control the power of laser beam applied from the optical pickup to the visible information recording layer (207) to write visible information at a timing that the optical pickup reads the radius position information recording part (201) formed on the visible information recording plane of the optical disc as a start point.

18. An optical disc recording/reproducing device having a spindle motor to which the optical disc according to claim 3 is set, wherein a visible information recording plane (202) faces an optical pickup and the optical pickup is moved in a radius direction while writing visible information to the visible information recording layer (207), the optical disc recording/reproducing device comprising:

a radius position information division region passage detection section for detecting passage of the radius position information division region based on contents read by the optical pickup;

a radius position information detection section for detecting an existing position of the optical pickup at the radius position of the optical disc based on contents obtained when the radius position information division region passage detection section does not pass the radius position information division region; and

a visible information recording control section for reading out data of visible information to be written to the visible information recording layer in accordance with the detected existing position, and controlling the power of laser beam applied

from the optical pickup to the visible information recording layer so as to write visible information.

19. An optical disc recording/reproducing device having a spindle motor to which the optical disc according to claim 3 is set, wherein a visible information recording plane (202) faces an optical pickup and the optical pickup is moved in a radius direction while writing visible information to the visible information recording layer (207), the optical disc recording/reproducing device comprising:

a radius position information division region passage detection section for detecting passage of the radius position information division region based on contents obtained when the optical pickup reads the radius position information recording part;

a radius position information detection section for detecting an existing position of the optical pickup at the radius position of the optical disc based on contents obtained when the radius position information division region passage detection section does not pass the radius position information division region;

a header detection section for detecting a header (901) having a fixed pattern of a fixed length based on an output from the radius position information detection section;

a radius position information detection section for detecting the header having a fixed pattern having a fixed length upon passage of no radius position information division region so as to detect radius position information based on the reading result of the radius position information detection section and the detection result of the radius position information division region passage detection section; and

a visible information recording control section for reading out data of visible information to be written to the visible information recording layer in accordance with the detected existing position, and controlling a power of laser beam applied from the optical pickup to the visible information recording

layer so as to write visible information.

20. The optical disc recording/reproducing device according to claim 16, 18 or 19, further comprising a precise rotation angle detection section for further dividing the detection information of the rotation angle detection section into equal portions, wherein a detection result of the precise rotation angle detection section is used as rotation angle information for visible image recording control.

21. The optical disc recording/reproducing device according to claim 19, wherein

the radius position information detection section detects, from the stripe patterns sequentially recorded a plurality of times, the stripe pattern of the header (901) having a fixed pattern of a fixed length upon passage of no radius position information division region so as to detect a plurality of pieces of effective radius position information, and further obtains position information in the stripe pattern of the radius position information divided for each of the certain ranges, based on presence/absence of passage of the radius position information division region of the stripe patterns sequentially recorded a plurality of times, the position of passage of the radius position information division region, and the detected plurality of pieces of effective radius position information, respectively from the detection result of the radius position information division region passage detection section, and

the visible information recording control section is configured to record visible image information by controlling intensity of the laser beam from the optical pickup while moving the optical pickup in the radius direction of the optical disc, based on the rotation angle and radius position detection information of the optical disc and the position information in the stripe pattern of the radius position information divided for each of the certain regions on an assumption that a rotation velocity of the optical disc is made constant.

22. An optical disc recording method used when the optical

disc according to claim 1 is set to a spindle motor (106) so that a visible information recording plane (202) faces an optical pickup (102), and visible information is written to a visible information recording layer (207) while an optical pickup is moved in a radius direction, the optical disc recording method comprising:

reading a radius position information recording part formed on the visible information recording plane (202) of the optical disc by means of the optical pickup so as to detect an existing position of the optical disc at a radius position; and

reading out data of visible information to be written to the visible information recording layer (207) in accordance with the detected existing position, and controlling a power of laser beam applied from the optical pickup to the visible information recording layer so as to write the visible information.

23. The optical disc recording method according to claim 22, further comprising controlling the power of laser beam applied from the optical pickup to the visible information recording layer so as to write visible information at a timing that the optical pickup reads the radius position information recording part (201) formed on the visible information recording plane (202) of the optical disc as a start point.

24. An optical disc recording method used when the optical disc according to claim 3 is set to a spindle motor (106) so that the visible information recording plane (202) faces an optical pickup (102), and visible information is written to the visible information recording layer while the optical pickup is moved in a radius direction, the optical disc recording method comprising:

detecting passage of a radius position information division region based on contents read by the optical pickup, and detecting an existing position of the optical pickup at the radius position of the optical disc based on contents obtained when the radius position information division region is not passed; and

reading out data of visible information to be written to

the visible information recording layer in accordance with the detected existing position, and controlling a power of laser beam applied from the optical pickup to the visible information recording layer so as to write visible information.

25. An optical disc recording method used when the optical disc according to claim 13 is set to a spindle motor (106) so that the visible information recording plane (202) faces an optical pickup (102), and visible information is written to the visible information recording layer while the optical pickup is moved in a radius direction, the optical disc recording method comprising:

- detecting whether or not a radius position information division region is passed, based on contents obtained when the optical pickup reads a radius position information recording part (201);

- detecting an existing position of the optical pickup at a radius position of the optical disc, based on contents obtained when the radius position information division region is not passed;

- detecting a header (901) having a fixed pattern of a fixed length based on an output from a radius position information detection section;

- detecting the header having a fixed pattern of a fixed length obtained when the radius position information division region is not passed so as to detect radius position information, based on a reading result of the radius position information detection section and a detection result of the radius position information division region passage detection section; and

- reading out data of visible information to be written to the visible information recording layer (207) in accordance with the detected existing position, and controlling a power of a laser beam applied from the optical pickup to the visible information recording layer so as to write visible information.

26. The optical disc recording method according to claim 22, 24 or 25, wherein detection information on a rotation angle

detection section is further divided into equal portions and taken as rotation angle information for visible image recording control, in using a detection result of a precise rotation angle detection section.

27. The optical disc recording method according to claim 25, further comprising:

detecting, from stripe patterns sequentially recorded a plurality of times, a stripe pattern of the header having a fixed pattern of a fixed length which has not passed the radius position information division region so as to detect a plurality of pieces of effective radius position information, and further obtaining position information in the stripe patterns of the radius position information divided for each of the certain regions, based on presence/absence of passage of the radius position information division region of the stripe patterns sequentially recorded a plurality of times, the position of passage of the radius position information division region, and the detected plurality of pieces of effective radius position information, respectively from the detection result of the radius position information division region passage detection section, and

recording visible image information by controlling intensity of a laser beam from the optical pickup while moving the optical pickup in the radius direction of the optical disc based on the rotation angle and radius position detection information of the optical disc, and the position information in the stripe pattern of the radius position information divided for each of the certain regions on assumption that a rotation velocity of the optical disc is made constant.